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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/632,740	08/01/2003	Laurent Bellaiche	8793-52026	3856

44692 7590 03/24/2005

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EXAMINER
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KOSLOW, CAROL M

ART UNIT	PAPER NUMBER
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1755

DATE MAILED: 03/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/632,740	BELLAICHE ET AL.	
	Examiner	Art Unit	
	C. Melissa Koslow	1755	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 24 January 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>1/24/05</u> . | 6) <input type="checkbox"/> Other: _____  |

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This action is in response to applicants' amendment of 24 January 2005. The declarations of 24 January 2005 have clarified the inventorship and thus the 102(f) rejection is withdrawn. The declaration and the supplied "Letters to Nature: article overcomes the 35 USC 102(a) rejection by showing the information in the thesis was not "by another". The 35 USC 112 first paragraph rejection with respect to written description is withdrawn, upon further consideration. The 35 USC 112, second paragraph rejection with respect to the total number of A and B variables and the rejections over claims 3 and 5. Applicants' arguments with respect to the fact the articles by Park et al and Bellaiche et al do not teach modulation of the atoms in each plane are convincing and thus the rejections over these references have been withdrawn. Applicant's arguments with respect to the remaining rejections have been fully considered but they are not persuasive.

The Swedish reference cited in Information Disclosure Statement of 24 January 2005 has a line drawn through it since the Examiner consider its English equivalents. Applicants are reminded that an Examiner need only consider one member of a patent family. Reference FB cited in Information Disclosure Statement of 24 January 2005 has a line drawn through it since it was cited in the previous Information Disclosure Statement and it was consider.

Applicants asked why a line was drawn through DG. It was drawn through it since the line said "Other information, citations identified as especially pertinent". There were no references given to be considered. This extraneous statement should not appear on any patent resulting from this application since it does not list any art.

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Applicant's claim for domestic priority under 35 U.S.C. 119(e) is acknowledged.

However, the provisional application upon which priority is claimed fails to provide adequate support under 35 U.S.C. 112 for claims 1-11 of this application.

The provisional application only teaches  $\text{Pb}(\text{Sc,Nb})\text{O}_3$  ordered along the [001] direction where the amount of niobium and scandium in each atomic plane is modulated. This teaching does not support the claimed materials.

Applicants argue the taught species supports the claimed genus. For claimed genus to be supported, then must be a representative number of species sufficient to show applicant was in possession of the claimed genus. A single species is not deemed to support a genus when one of ordinary skill in the art could not predict the operability of any other species encompassed by the genus other than that disclosed. *In re Curtis*, USPQ2d 1274,1282 (Fed. Cir. 2004); *Enzo Biochem*, 69 USPQ2d,1615 and *Noelle v. Lederman*, 69 USPQ2d 1508, 1514 (Fed. Cir. 2004). The provisional application states in paragraph [001] that it is a challenge to relate the microstructure of the alloy to the properties of the alloy and that the atomic ordering of perovskite alloys lead to unexpected properties. This statement indicates the art is unpredictable. Therefore, one of ordinary skill in the art could not predict which other perovskite alloys, besides those discussed in the provisional application, which are atomically ordered along a direction different than the polarization direction and where the amounts of the A or B atoms are modulated will have temperature dielectric and piezoelectric properties which are substantially enhanced over the dielectric and piezoelectric properties of the disordered alloy, where the temperature is below the Curie temperature. Applicants' arguments appear that all alloys having the claimed microstructure will inherently have the claimed properties, but there is nothing in

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the provisional application to support this argument. The sections to the provisional application applicants point to state the claimed microstructure may be obtained and that the structure should lead to the claimed enhancements. These statements in addition to one discussed above would again indicate there is no certainty that all perovskite alloys having the claimed microstructures will have the claimed properties. Applicants' arguments have not shown that the provisional application provides adequate support under 35 U.S.C. 112 for claims 1-11 of this application.

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: The ferroelectric material of claims 1-11. The specification only teaches  $\text{Pb}(\text{Sc},\text{Nb})\text{O}_3$  ordered along the [001] direction where the amount of niobium and scandium in each atomic plane is modulated. This teaching does not support the claimed materials.

Claims 1-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "short" in claims 1 and 9 is a relative term which renders the claim indefinite. The term "short" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The specification only teaches a four-plane period, thus it cannot be determined what the maximum number of plane periods meet the claimed "short stacking period".

Applicants argue that "short stacking period" is defined as is the period where the alloy has dielectric and piezoelectric properties are substantially enhanced and that as the period gets

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thicker the substantially enhanced properties are smaller. This teaching does not define short since it does not clearly indicate at what number of periods are the properties are no longer substantially enhanced. It is noted that applicants do not define what is meant by “substantially enhanced”. Without this definition, one cannot determine what is the maximum number of periods the alloy can have and still be considered short. The rejection is maintained.

Claims 1-11 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for  $\text{Pb}(\text{Sc,Nb})\text{O}_3$  ordered along the [001] direction where the amount of niobium and scandium in each atomic plane is modulated, does not reasonably provide enablement for any ferroelectric perovskite atomically ordered along a direction that is not the polarization direction. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims.

If the claimed subject matter is not found in the specification, it clearly cannot be enabled. Once applicants insert the claimed subject matter into the specification, then this rejection will be withdrawn with respect to claims 1-8. The rejection will be maintained for the subject matter of claims 9-11 for the reasons discussed above with respect for the support of the claimed invention in the provisional application.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1 and 3-8 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by the article by George et al.

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This article teaches a lead perovskite ferroelectric material which is ordered along the [001] direction and where the amounts of Sc and Nb are modulated from plane. This perovskite is composed of 12-plane stacks and have as the B elements Sc and Nb. The last page shows that the taught materials have piezoelectric and dielectric properties substantially enhanced over those properties when these materials are disordered. The article indicates these properties were measured at room temperature, since there is no temperature given. Room temperature is less than the Curie temperature of the taught materials. The reference teaches the claimed material.

Applicants argue that the reference does not teach the claimed invention since it does not enhanced properties at any temperature below the Curie temperature. The reference teaches the enhanced properties at room temperature, which falls within the claimed range. The teaching at one point in a range anticipates the invention. See MPEP 2131.03 (I). The rejection is maintained.

Claims 1-8 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by the abstract and slides of the presentation given in February 2001.

These references teach a lead perovskite ferroelectric material which are ordered along the [001] direction. This perovskite is composed of four-plane stacks and have as the B elements Sc and Nb. Slides 10 and 15 teach the same planar composition as that taught in the specification. Slides 11 and 12 show that the taught materials have piezoelectric and dielectric properties substantially enhanced over those properties when these materials are disordered. The references indicate these properties were measured at room temperature, since there is no temperature given. Room temperature is less than the Curie temperature of the taught materials. The references teach the claimed material.

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Applicants argue that the reference does not teach the claimed invention since it does not enhanced properties at any temperature below the Curie temperature. The reference teaches the enhanced properties at room temperature, which falls within the claimed range. The teaching at one point in a range anticipates the invention. See MPEP 2131.03 (I). The rejection is maintained.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melissa Koslow whose telephone number is (571) 272-1371. The examiner can normally be reached on Monday-Friday from 8:00 AM to 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo, can be reached at (571) 272-1233.

The fax number for all official communications is (703) 872-9306.


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR



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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

cmk  
March 18, 2005



C. Melissa Koslow  
Primary Examiner  
Tech. Center 1700